"Dedicated to Public Service"

THE RADIATOR

Chico Golden Empire Amateur Radio Society, Inc.

SPECIAL SERVICE CLUB

W6RHC
IRLP #8170

www.gearsw6rhc.org

P.O.Box 202 Chico, CA 95927

July 2022 Newsletter	GEARS Founded August 13, 1939

From the President.....

Patriotism is important all year long but July seems to bring it out in all of us. A great time of the year for all of us to have family and organizational times together to celebrate and be thankful for the opportunities we have. Waving the RED, WHITE AND BLUE all year long is wonderful, but July just brings it out so special.

I missed our Field Day day as I am traveling with my family but reports of a successful and really good time have been great to hear. About 25 hams and guests participated and we welcomed two new members, Russ Doughty KE6PMT and Jeff House KE6JK. The QYT VHF/UHF radio prize was won by Russ, congratulations. Our tentative score we'll send into the ARRL is 3830.

I want to thank Michael Favor N6FAV, Larry Mitchel KF6NCX and Kent Hastings WA6ZFY for organizing Field Day. I'm sorry I missed Michael's smoked Tri-tip dinner, I heard it was fantastic.

I am looking forward to seeing you all July 9th, 9:00 am at the Farmer's Skillet for our Saturday breakfast and Friday, July 15th for our regular meeting.

Enjoy your July - the hot dogs, the burgers, the fun and keep our nation in your warmest thoughts and prayers.

'73
Paul Stewart N6PAS
n6pas1@gmail.com

Join GEARS on Facebook www.facebook.com For timely news and additional information.

July 2022 Calendar

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3 8pm OARS Net	4 7pm GARS Net 8pm ARES Net	5 7pm PARS Net 7:30pm GEARS Net	6	7 7:30pm Simplex Net	8 7pm OARS meeting 7pm GARS meeting	9 9am Chico Breakfast
10 8pm OARS Net	11 7pm GARS Net 8pm ARES Net	12 7pm PARS Net 7:30pm GEARS Net	13	14 7:30pm Simplex Net	15 6pm GEARS Meeting	16
17 8pm OARS Net	18 7pm GARS Net 8pm ARES Net	19 7pm PARS Net 7:30pm GEARS Net	20	21 7:30pm Simplex Net	22	23 9am OARS Breakfast
24 / 31 8pm OARS Net	25 7pm GARS Net 8pm ARES Net	26 7pm PARS Net 7:30pm GEARS Net	27	28 7:30pm Simplex Net	29	30

VEC Testing, FCC License Exam available by appointment. For information or registration call Tom Rider, W6JS 530-514-9211
Chico Breakfast 2nd Saturday 9am Farmers Skillet Cohasset Rd, Chico
GEARS Board Meeting 1st Monday 7pm by zoom.
PARS Meeting 2nd Thursday 6:30pm, doors open 6pm Old Magalia Community Resource Center
OARS Meeting Second Friday of the month, St. Pauls Episcopal Church Hall, Oroville.
GARS Meeting Second Friday of the month, Lutheran Church Hall, Artois.
Butte ARES Meeting 3rd Tuesday, TBD Contact Dale Anderson, KK6EVX 826-3461 for more information.
GEARS Meeting, Doors open 6pm, meeting 7pm at Scuba Hut 2725 Highway-32, Chico, CA 95973
OARS Breakfast 4th Saturday of the month, at Cornucopia of Oroville.

NETS:
OARS Club Net Sunday 8pm 146.655 Mhz - PL 136.5
GARS Club Net Monday,7:00 pm 147.105 MHz + PL 110.09, secondary: 146.850 MHz-PL 110.9
Butte ARES Net Mondays 8pm 145.290 MHz - PL 110.9
Yuba Sutter Club Net Monday 7pm 146.085 MHz + PL 127.3
GEARS Club Net Tuesdays 7:30 PM 146.850 MHz - PL 110.9
PARS Club Net Tuesday 7pm 145.290 - PL 110.9
Simplex Net Thursday 7:30 p.m. 146.52 no tone
Yuba Sutter ARES Net Thursdays 7pm 146.085 MHz + PL 127.3
Sacramento Valley Traffic Net Nightly 9:00 PM 146.850 MHz - PL 110.9

GEARS Century Members

Dale Anderson, Kathy & Michael Favor
Kent Hastings, Bennett Laskey, Jim Van Sickle
We thank these members for their extra support.

What is a Screwdriver Antenna?

By Mark Haverstock, K8MSH

When I first heard the term screwdriver antenna, I thought it was a joke. I immediately thought of stories about loading wet noodles, bedsprings, and random trees in the forest as antennas. Or perhaps the screwdriver antenna was a myth, something like the Wouff-Hong.

Many of us have used loading coils to match a vertical antenna, and that's the principle behind the screwdriver antenna. A screwdriver is a vertical antenna with a remotely adjustable center-loading coil. Intended for mobile operation, it may be adjusted to cover any band from 6m to 75m. The antenna takes its name from the use of a reversible DC electric motor like those found in electric screwdrivers. It takes the hassle out of moving clips manually along the coil.

History

The original DK-3 Screwdriver Antenna design was created by Don Johnson (not the Miami Vice star). Don, W6AAQ (sk), was also the author of a book on HF mobile operation, 40 years of HF Mobileering. When the FCC first authorized HF mobile, a group in the San Francisco Bay area decided to go mobile on 75 meters. They chose 3995 KHz as an operating frequency to reduce the possibility of high-power fixed stations interfering.

Johnson and the group conducted field tests with home-brewed antennas using a field strength meter to see who had the strongest signal. He came up with the idea of using a metal tube with a whip on top of a coil that fit inside the tube. During his search for a method of tuning the antenna remotely, Denney Moore, W6MHP (sk), suggested using the motor from a cordless screwdriver—and the screwdriver mobile antenna was born. Johnson received a patent in 1991 for the device and thousands were sold.

Theory of Operation

Screwdriver antennas combine a loading coil with a whip antenna, typically 32 to 102 inches long. The loading coil is adjustable to cover multiple HF bands, and the unused portion slides into a hollow tube. Concealed inside is a reversible DC motor. The motor, operated remotely by a momentary switch or an electronic controller, moves the whip and loading coil so that part of the coil is inside the base (and electrically bypassed, or inactive) and the rest of the coil is in use as a loading coil tuned for the selected band.

When changing frequencies, the antenna loading coil is extended or retracted to tune the antenna to the new frequency. A gear-motor turns a threaded rod (typically 1/4×20 all-thread) in and out of a nut or threaded boss attached to the bottom of the coil. This in turn moves the coil in and out of the mast. Contacts at the top of the mast slide along the outside of the coil, adjusting the resonant point.

Since this adjusts the loading coil to resonance, no external antenna tuner is required. Very low SWR can be achieved on any frequency in the HF ham bands 80-10 meters, depending on the length of the whip that is used. Shorter whips work better on the higher bands such as 6-15 meters; longer whips will work on 80 and 40 meters.

Stealth Antenna for Home

Screwdriver antennas aren't just for mobile use. Ground mounting the screwdriver antenna in an HOA neighborhood is rather simple since the base of the antenna can be mounted to a readily available 4-foot water pipe which is driven into the ground with 6 to 12 inches extending above the ground level. A good ground plane is essential to making the antenna perform well. Ground planes can consist of multiple wires spread out in multiple directions from the base of the antenna; the more the better. Alternatively, one can use 2-foot-wide galvanized wire mesh screen which is laid out in four directions from the base of the antenna running approximately 12 feet in length.

You can mount a screwdriver antenna above ground, such as on a patio roof, but you should cut your ground plane wires to match the bands that you intend to operate on. This is true for all vertical antennas—once you mount a vertical antenna above ground level, then the ground plane radial wires need to be cut to specific lengths, whereas ground mounting does not require resonant radial wires.

Tuning
With the toggle switch, you can watch an SWR meter dip as the antenna is driven to resonate at a desired frequency. However, this method does not provide for any memory presets for favorite frequencies.

Some screwdriver antennas incorporate a turn counter to allow an electronic controller to retune the antenna to memory presets. The antenna uses a small magnet that spins past a reed switch which allows the controller to measure the switch pulses (i.e., turns) as the magnet rotates with the motor.

Antennas
Screwdriver antennas come in a variety of sizes, ranging from 4 feet to more than 12 feet when fully extended. Unless you have a pickup or large SUV, you'll probably want to stick with compact versions. The larger ones require heavy-duty mounts to support antenna weight and provide stability when driving.

Location, Bonding, and Other Factors
A vehicle's body makes a poor ground plane at HF, so you also need to consider antenna placement, grounding, and bonding in the installation process. Maximizing the limited ground plane a vehicle offers is worth the effort. It's the metal mass directly under the antenna, not what's alongside, that counts.

The best possible scenario would be to center the antenna on the roof. Unfortunately, it may not be practical considering the height and the possibility of disturbing the side curtain airbags. Alternatives would include mounting around the hood or in the trunk area.

Minivans, SUVs, RVs, Jeeps, station wagons, and crossovers present a challenge. Except for front mounting, the body of these vehicles can shadow a large portion of the antenna. This causes tuning problems and reduces efficiency. If shadowing can't be avoided, make sure the coil is as far away from metal as possible to minimize coil losses. Also, trailer hitch mounting is the least desirable location due to shadowing.

Of course, properly grounding the antenna itself is especially critical with luggage rack mounting. Many luggage racks are not bonded to the vehicle and will require some extra effort to do so. Clamp mounts like the K400 might save you from drilling a visible hole, but they can cause body damage if the antenna is stressed by highway speeds or hits a low-hanging object. Since the return path for the coax depends on the integrity of the mount's hinges and set screws, they can also increase ground losses.

Continue by bonding the hood and trunk lid to the car body—horizontal surfaces are more important than vertical ones. Depending on the vehicle, there can be several dozen other places where ground straps will help. These include, but are not limited to, bumpers, suspension parts, rear axles, exhaust system, tailgates, and just about any bolted-on piece of hardware.

But Do They Work?
Yes they do, but there is a tradeoff between convenience and performance. Realize that the screwdriver is a compromise antenna design with a radiator that's electrically short. You'll find that the lower bands 80/40m have limitations, but as you go to the higher frequencies, 20-10m, they'll perform better. You'll even work some DX when the bands are open.

GEARS Repeaters

GEARS West on St. John
145.410 MHz PL is 123.0 Negative offset.
PL both input and output (CTSS)

GEARS East in Forest Ranch
146.850 MHz Negative offset. PL 110.9 CTSS
440.650 MHz Plus offset, PL 110.9 Hz

2022 FIELD DAY

Dr. Carol Milazzo KP4MD, the ARRL Sacramento Valley Section Manager, visited our local group.

Ken Couch KE6DHU

Bill Shocknesse N6WLM, Kaylee Shocknesse, Jamie Johnsston KN6PWW

Russ Doughty KE6PMT won a QYT VHF/UHF radio,
Jim Matthews K6EST

Michael Favor N6FAV, Kevin Sterling K7KFS, Tony Stefanetti KN6UNT

Larry Mitchell KE6NCX

Kent Hastings WA6ZFY

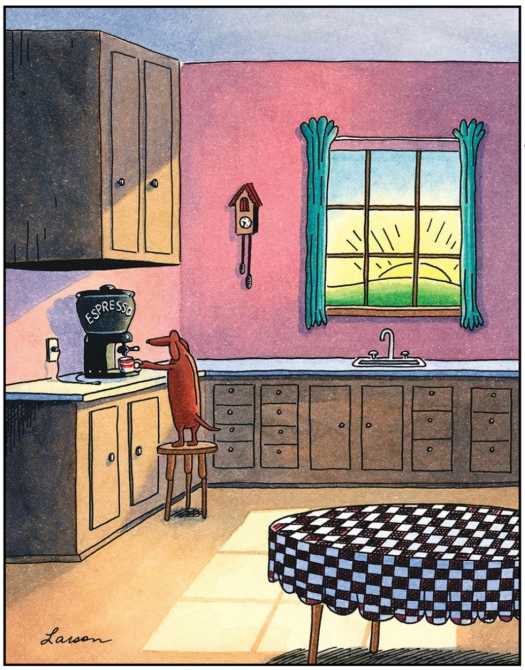
GEARS Officers:

President..... .....Paul Stewart, N6PAS
Vice-President.....Kent Hastings, WA6ZFY
Secretary.....Steven Wright, KM6DBS
Treasurer.....Jim Matthews, K6EST
Director.....Bennett Laskey, K6CEL
Director.....Dale Anderson, KK6EVX
Director.....Rich Astley, N3UOR
Past President.....Jim Matthews, K6EST
VEC.....Tom Rider, W6JS
ARES..... Dale Anderson, KK6EVX

GEARS Dues and Donations can be made online at
paypal.me/w6rhc
Or by mail to:
GEARS
PO Box 202
Chico, CA 95927

Your dues and contributions support our local repeaters, ARES, and outreach events to keep amatuer radio alive in our area. GEARS also makes donations to support other local repeaters.

GEARS Newsletter edited by Jim Matthews K6EST
JiminChico@yahoo.com



While their owners sleep, nervous little dogs prepare for their day.